MEMORANDUM

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
SOUTH CENTRAL REGIONAL OFFICE
WATER DIVISION

7705 Timberlake Road Lynchburg, VA 24502

SUBJECT: TAYLOR – RAMSEY CORPORATION, VPDES PERMIT # VA0081213, TOXICS MANAGEMENT PROGRAM TECHNICAL DATA REVIEW

TO: Ed Jones, Environmental Engineer - SCRO

FROM: Kirk Batsel, Sr. Environmental Engineer - SCRO

DATE: June 13, 2004

COPIES: Permit file

General Background

The subject facility is a wood preserving facility with a SIC of 2491. The VPDES permit for the subject facility is currently in the process of reissuance. The permit was last reissued on August 26, 1999 and expires on August 26, 2004. The current permit requires annual acute toxicity tests using C. dubia as the indicator organism. The permit requires a retest should any test result in a calculable LC_{50}, with quarterly acute tests w/ P. promelas and C. dubia if the retest also results in toxicity. During the last reissuance, C. dubia was determined to be the most sensitive indicator species (MSS). The fact sheet for the current permit indicates that "data generated during the (prior)…permit cycle has shown that continued annual compliance monitoring is appropriate for the upcoming (current) permit reissuance". However, the fact sheet did not contain a TMP technical data review in support of this recommendation. A review of the permit, permit processing, monitoring, and correspondence files also failed to yield a previous TMP data review. As a result, I completed a review of all available toxicity test data.

Data Summary

A total of thirteen acute toxicity tests were evaluated during this technical review. This included one (1) acute test utilizing P. promelas and twelve (12) acute tests utilizing C. dubia as the indicator organism. Of these tests reviewed, one (1) test was considered invalid due to not meeting the required sample holding time. All tests were performed using grab samples of effluent from outfall 001. Results of all toxicity tests evaluated in this technical review are presented in Table 1 below.

Table 1. (Acute Toxicity Tests)

Test Date	Test Organism	LC_{50} (%)	% Survival in 100% effluent	Testing Laboratory
02/99	*C. dubia*	**11.5**	0 (15% in 25%)	CBI
02/99	*P. promelas*	>100	100	CBI
03/99	*C. dubia*	**19.8**	0 (20% in 25%)	CBI
04/99	*C. dubia*	>100	100	CBI
08/00	*C. dubia*	>100	60	CBI
12/01	*C. dubia*	**42.0**	0 (25% in 50%)	CBI
02/02	*C. dubia*	**57.4**	0 (70% in 50%)	CBI
06/02	*C. dubia*	INVALID	INVALID	CBI
06/02	*C. dubia*	>100	95	CBI
11/02	*C. dubia*	**95.2**	45	CBI
03/03	*C. dubia*	>100	100	CBI
12/03	*C. dubia*	**87.7**	35	CBI
12/03	*C. dubia*	>100	90	CBI

Note: Tests from 8/00 – 12/03 conducted during this permit term.

Note: It was noted that field parameters were not completed or provided by sampling firm on several occasions. This data is required to be provided with each effluent sample for toxicity analysis.

Discussion

Of the total of twelve (12) valid acute toxicity tests reviewed, a total of six tests have resulted in a calculable LC_{50} value or 50% of all tests. Based on this, **the data generated to date have indicated that outfall 001 effluent is acutely toxic to the invertebrate indicator organism.** The current permit TMP condition indicates the need for a Toxicity Reduction Evaluation (TRE) and Whole Effluent Toxicity (WET) Limitation. However, at this time, the agency is not placing stormwater only discharges in TRE or applying WET limitations to this type discharge. Rather, the agency is utilizing screening toxicity tests along with chemical specific testing as indicators of stormwater quality for evaluation of the effectiveness of site-specific Storm Water Pollution Prevention Plans (SWP3s).

Further, based on the VPDES application submitted for reissuance, this facility is phasing out the use of CCA wood preservative and converting to the use of Wolman® E (CA-B) treating solution. The facility will also be using MOLD INHIBITOR K-18500 and MOLDICIDE WE in their wood treatment process. All three chemicals are products of Arch Wood Protection, Inc. of Conley, Georgia. A review of the three MSDS sheets provided indicates that all three are toxic to aquatic life.

Due to possible historical site contamination and the use of the above products, stormwater discharged from the facility's industrial areas is considered to have the potential for effluent toxicity.

Conclusions/Recommendations

1) Based on the above discussion, it is recommended that semiannual acute toxicity tests be included in the stormwater screening conditions of the reissued permit.

2) The acute tests should be a definitive 48-Hour Static Acute tests using *Ceriodaphnia dubia* and utilizing a geometric series (standard 0.5 series or other).

3) It is also recommended that chemical specific effluent samples be collected at the same time as toxicity test samples.

4) It recommended that the facility complete an evaluation of the current SWP3, site operations, site conditions, and make any necessary modifications to reduce actual and potential effluent toxicity.

WHS - WAM - PPB - File

These guidelines have not been finalized. Proposed limits may change. FKC

INTER-DEPARTMENTAL MEMORANDUM

SUBJECT : Effluent Guidelines for Reverse Osmosis Plants

TO : Al Willett

FROM : Vincent Carpano VFC

DATE : August 7, 1987

COPIES : DBR; L. G. Lawson; File

Mr. McBride requested guidance regarding the discharge of wastewater from desalinization plants in anticipation of forthcoming NPDES permit applications for such discharges.

EPA has not promulgated any guidelines for water treatment plants of any kind nor do they have a project established for developing guidelines for desalinization plants or any other type of water treatment plant. The suggested guidance which is provided below are best professional judgement recommendations based on various sources of information.

Discharges from a reverse osmosis facility will depend on the source of the raw water. The raw water may be

a. Surface Water
b. Well Water
c. Process Water

1. Limitation guidance for situations where raw water is surface water:

a/TDS

Since the dissolved solids discharged essentially all come from surface waters, it is doubtful that the increase in the receiving stream's TDS will be high enough to adversely impact the receiving water; however, a mass balance check can be made to insure that in the case of discharge above a drinking water intake will not exceed the 500 mg/l drinking water standard. An appropriate limit for TDS should be specified if the mass balance check shows a problem.

In the case of estuaries or seaside intakes, where source water TDS is high, there should be no need to specify a TDS limit.

b/TSS

No TSS need be considered for the reverse osmosis discharge since reverse osmosis plant cannot operate effectively if TSS is high in the source water.

c/pH

Use the water quality standard appropriate for the receiving water.

d/D.O.

The dissolved oxygen in the discharge of a reverse osmosis plant is depressed and, depending on the magnitude of the discharge, the receiving stream's D.O. can be lowered below stream standards. This could be addressed by specifying a mixing zone in the permit requiring stream standards D.O. be met at the boundary of an appropriately sized mixing zone.

2. Limitations guidance where raw water is well water

a/TDS

A mass balance check should be made to insure that drinking water standards will not be violated by a discharge into a stream which has a drinking water intake. An appropriate limitation for TDS should be specified to meet the 500 mg/l TDS standard.

If there is no drinking water intake, an appropriate TDS limitation should be specified to meet an in-stream TDS concentration of 800 mg/l in a fresh water stream. (NOTE: This is a best professional judgement limitation based on VWCB (1) and TVA (2) studies made on the N.F. Holston River.

If the receiving waters are ocean or estuaries, no TDS limitations are necessary.

b/tss

Same as 1,b above.

c/pH

Same as 1,c above.

d/D.O.

Same as 1,d above.

e/Cations, Anions, Radiation

Since well water can contain cations, anions, or radiation which could exceed stream standards, appropriate limitations

should be specified based on the analysis of the proposed discharge. Cations and anions shown to be present that are not covered by water quality standards, should be limited with the same considerations that are used for any other industrial permit.

3. Limitations guidance where raw water is process water.

TDS, TSS, pH, D.O., other parameters same as 2,a,b,c,d,e above.

Attached is a copy of Table 1., "Source,, Product, and Concentrate Pollutant Characteristics from Water Production by Reverse Osmosis", which might be helpful in getting a feel for what one might expect from the treatment of brackish and sea water.

Ref. (1), "Report on Olin Corporation, Saltville, Virginia, Compiled by SWCB, SWRO, Abingdon, Va.", dated April 23, 1976.

Ref. (2), "An Assessment of the Status of Fish and Bethic Macroinvertebrate Communities in the North Fork Holston River", prepared by Donley M. Hill, Thomas McDonough, Charles F. Saylor, and Steven A. Ahlstedt, Division of Water Resources Office of Natural Resources, Tennessee Valley Authority, Norris, Tennessee, June 1980.

Jones,Edward
From: Dan Gibson [dgibson@avistatech.com]
Sent: Tuesday, April 13, 2004 12:02 PM
To: Jones,Edward
Cc: Dan Comstock; Dave Walker; KECogan@archchemicals.com
Subject: FW: Taylor-Ramsey

Dear Ed,

I have located the antiscalant projections from March 24, 2004. Based on the attached projection and water chemistry we predict a final concentrate range of 600-900 TDS. To determine the historical range, periodic testing of the feed water TDS and concentrate TDS is recommended.

The Vitec 4000 antiscalant will not change the TDS values at the low dosages that we require (3.8-4.0 ppm). Please feel free to contact us with any further questions.

Regards,

Dan Gibson
Technical Specialist

-----Original Message-----
From: Cogan, Ken E **SMYR [mailto:KECogan@archchemicals.com]
Sent: Tuesday, April 13, 2004 8:56 AM
To: dgibson@avistatech.com
Subject: FW: Taylor-Ramsey

-----Original Message-----
From: Dave Walker [mailto:dwalker@avistatech.com]
Sent: Monday, April 12, 2004 7:29 PM
To: edjones@deq.state.va.us
Cc: Cogan, Ken E **SMYR
Subject: RE: Taylor-Ramsey

Dear Ed,

The Vitec 4000 does not contain any chemicals that are on the "Federal Priority Pollutant List". FYI, Avista does not produce any products that appear on this list.

It is difficult to track all of the end users of our products since we sell through various companies around the country, however, I have put together a short list of users of the Vitec 4000. Please remember that this information is considered confidential to Avista.